Lifestyle Pattern of the Selected Obese Subjects in Coimbatore District

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Abstract: Obesity is primarily due to altered sedentary lifestyles, energy-dense diets and low-levels of physical activity. Industrialization and urbanization which lead to rise in standards of living, also promote weight gain and obesity rates begin to rapidly rise thus posing a growing threat to the health of the nation. A key factor in the progressive increase in the prevalence of obesity is sedentary lifestyle. The aim of this study was to assess the lifestyle pattern of obese subjects residing in Coimbatore city. A well-structured interview schedule was formulated to elicit information on the lifestyle practices followed by the selected subjects by using a pretested questionnaire. The data collected were systematically consolidated and statistically analyzed. Exercise plays a vital role in the management of the lifestyle disorders. It is necessary to educate the public about lifestyle modification and adopt appropriate exercise with healthy food habits for physical fitness.

Keywords: Obesity, Lifestyle habits, Coimbatore, overweight.

1. Introduction

Industrialization and urbanization which lead to rise in standards of living, also promote weight gain and obesity rates begin to rapidly rise thus posing a growing threat to the health of the nation. Now recognized as a serious medical problem, obesity affects about 30 per cent of adults, and about 14 per cent of children and adolescents in the United States. A sedentary lifestyle plays a significant role in obesity. Worldwide there has been a large shift towards less physically demanding work, and currently at least 60% of the world's population gets insufficient exercise. This is primarily due to increasing use of mechanized transportation and a greater prevalence of labour (8).

In adults, there appear to be declines in levels of physical activity due to less walking and physical education. World trends in active leisure time physical activity are less clear (2). Among the several strategies for obesity treatment, diet and exercise are considered useful for losing weight in moderately obese adults. However, it seems that even losing weight with these approaches, most obese individuals do not maintain the loss for long periods. Unfortunately, there are no accepted rules to guide interventions promoting behaviour and lifestyle changes for an effective and permanent weight loss (4).

2. Materials and Methods

A famous cardiac clinic namely Preetham Cardiac Care in Coimbatore, KR Hospital in Karamadai and KPS Hospitals in Mettupalayam town near Coimbatore were selected as venue for the present study. These hospitals were selected on the basis of easy accessibility and availability of adequate number of obese subjects and they were periodically visiting the hospital for their regular check-ups. The subjects visiting the hospital are from in and around Coimbatore district. For the study, 1000 subjects in the age group of 40-60 years from both sexes (571 women and 429 men) and whose BMI ≥ 30 and total cholesterol level ≥ 200mg/dl based on their willingness to participate were selected for screening. All subjects gave their written consent to participate into this study which has been approved by the Human Ethical Committee of Avinashilingam University. (HEC.2011.29). The selected subjects were given orientation regarding the protocol of the study and also briefed on the modalities and purpose of the study.

A well-structured interview schedule was formulated to elicit background information about the selected subjects. The lifestyle pattern such as exercise pattern, smoking habits, alcoholic habits, consumption of tea, coffee, health drinks, tobacco, and pan masala were collected using the interview schedule. The data collected were systematically consolidated and statistically analyzed for arriving at the results of the dietary habits practiced among the selected obese subjects in Coimbatore district.

3. Results and Discussion

3.1 Body Mass Index

The Body Mass Index is used to assess how much an individual's body weight departs from what is normal or desirable for a person of his or her height. The WHO regards a BMI of less than 18.5 as underweight and may indicate malnutrition, an eating disorder, or other health problems, while a BMI greater than 25 is considered overweight and above 30 is considered obese (12). BMI was computed using height and weight and classified on the basis of NIN Methodologies (2012) and given in Table I.

<table>
<thead>
<tr>
<th>Classification¹</th>
<th>Obesity grade</th>
<th>Male (N=429)</th>
<th>Female (N=571)</th>
</tr>
</thead>
<tbody>
<tr>
<td>[1]</td>
<td></td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

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¹Classification of BMI: Underweight (BMI < 18.5), Normal weight (BMI 18.5-24.9), Overweight (BMI 25-29.9), and Obesity (BMI ≥ 30).
The mean triglycerides values of the selected subjects were
respectively for females. The mean HDL- C and LDL- C of
as higher total cholesterol levels than male which was greater
for male and 219.4 mg/dl for female. Female had slightly
Mean total cholesterol levels were found to be 194.5 mg/dl
levels when compared to the desirable values.

According to BMI values the obesity grades were recorded
from normal to obese class III. The above table reveals that
around 55.5 per cent of male and 55.9 per cent of female
were under the mild obese class I category and only 1.9 per
cent of both male and female were in the pre obese category
which is considered as “At risk of obesity’. It is to be noted
that 26.8 per cent of male and 24.5 per cent of female fell in
the moderate obese class I, around 10.2 per cent of male and
9.5 per cent of female were in the mild obese class II as per
the classification.

Similarly a worrying scenario in the study happened to be the
fact that 2.6 per cent of male and 3.3 per cent of female were
in the obese class III group whose BMI is ≥ 40.

3.2 Lipid Profile

Table II shows the mean lipid profile of the selected obese
subjects.

Table 2: Lipid profile of the selected subjects (N-1000)

<table>
<thead>
<tr>
<th>Lipid Profile (mg/dl)</th>
<th>Desirable Values* (mg/dl)</th>
<th>Male (N=429)</th>
<th>Female (N=571)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean ± SD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Cholesterol</td>
<td>&lt; 200</td>
<td>194.5 ±73.5</td>
<td>219.4±78.6</td>
</tr>
<tr>
<td>Low density lipoprotein-C</td>
<td>&lt; 130</td>
<td>124.1±67.9</td>
<td>145±73.4</td>
</tr>
<tr>
<td>High density lipoprotein-C</td>
<td>&gt;50</td>
<td>42±10.5</td>
<td>42</td>
</tr>
<tr>
<td>Triglycerides</td>
<td>&lt; 150</td>
<td>141.9 ±63.5</td>
<td>161±63.7</td>
</tr>
<tr>
<td>Very Low density lipoprotein-C</td>
<td>&lt;30</td>
<td>28.4 ±12.7</td>
<td>32.4 ±12.8</td>
</tr>
</tbody>
</table>

*National Cholesterol Education Program, 2012 (9)

Mean total cholesterol levels were found to be 194.5 mg/dl
for male and 219.4 mg/dl for female. Female had slightly
higher total cholesterol levels than male which was greater
than the desirable levels. The mean HDL- C and LDL- C of
the selected subjects were recorded as 42.0 mg/dl and 124.1
mg/dl respectively for male and 42.0 mg/dl and 145.4 mg/dl
respectively for females.

The mean triglycerides values of the selected subjects were
noted as 141.9 mg/dl for male and for female it was recorded
as 161.6 mg/dl. Similarly the mean VLDL values recorded
were 28.4 mg/dl for male and 32.4 mg/dl for female. In
general most of the female subjects had elevated lipid profile
levels when compared to the desirable values.

3.3 Lifestyle Variables of the Selected Obese Subjects

Overweight and obesity are dangerous conditions as they can
contribute to a number of different health problems (eg, heart
disease and diabetes). It is therefore extremely important that
obesity is treated aggressively. Lifestyle changes remain the
mainstay of treatment and are important for the long term
maintenance of weight loss (5). The lifestyle of the selected
subjects such as activity pattern, exercise pattern, alcohol
consumption, smoking habits, consumption of tea, coffee and
health drinks are discussed in the following tables.

a. Activity pattern

Physical activity is essential to maintain ideal body weight by
burning excess calories and is of vital significance for health
and prevention of diseases. Consistent epidemiological
evidences identify that physical activity is a major modifiable
risk factor in reduction of non communicable chronic
diseases (10).

A sedentary lifestyle is a type of lifestyle with no or irregular
physical activity. A person who lives a sedentary lifestyle
can colloquially be known as a couch potato. It is commonly
found in both the developed and developing world. Sedentary
activities include sitting, reading, watching television, playing
video games, and computer use for much of the day
with little or no vigorous physical exercise. Moderate activity
includes brisk walking, stair-climbing, carrying small
children, mopping floor, scrubbing the bathtub, car washing,
general gardening and heavy activity includes playing at a
fast pace, heavy gardening and other industrial works. The
activity pattern of the selected obese subjects is recorded and
presented below in Table III.

Table 3: Activity pattern of the subjects

<table>
<thead>
<tr>
<th>Type of activity</th>
<th>Male (N -429)</th>
<th>Female (N -571)</th>
<th>Total (N -1000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sedentary</td>
<td>162</td>
<td>182</td>
<td>344</td>
</tr>
<tr>
<td>Moderate</td>
<td>188</td>
<td>287</td>
<td>475</td>
</tr>
<tr>
<td>Heavy</td>
<td>79</td>
<td>179</td>
<td>158</td>
</tr>
<tr>
<td>Total</td>
<td>429</td>
<td>571</td>
<td>1000</td>
</tr>
</tbody>
</table>

Among the selected subjects sedentary activity was done by
37.8 per cent and 31.9 per cent of male and female
respectively. With regard to the moderate activity pattern
43.8 per cent and nearly 50.2 per cent of male and female
were doing moderate activity. It was shocked to note that
heavy activity was done only by 18.4 per cent and 17.9 per
cent of male and female subjects respectively. Overall picture
of the selected obese subjects revealed that 34.4 per cent
were doing sedentary activity. 47.5 per cent were doing
moderate activity and only 18.1 per cent were following
heavy activity and this is mainly because of their occupation
like business and professionals.

Day-to-day activities like walking, housework and gardening
will be beneficial not only in weight reduction but also for
lowering of blood pressure and serum triglycerides. It also
elevates HDL (good) cholesterol in blood. Simple
modification in lifestyle like deliberately climbing up the
stairs instead of using the lift and walking for short distance
instead of using a vehicle could also immensely help in
increasing physical activity. A sedentary lifestyle can contribute to many preventable causes of death (10). Increasing amounts of physical activity may be necessary to maintain constant body weight of the individual with increasing age.

Sedentary lifestyle plays a significant role in obesity. Chiles and Van Watten (2010) (2) states that worldwide there has been a large shift towards less physically demanding work, and currently at least 30 per cent of the world’s population gets insufficient exercise. This is primarily due to increasing use of mechanized transportation and a greater prevalence of labor-saving technology in the home.

b. Exercise pattern
Physical exercise is any bodily activity that enhances or maintains physical fitness and overall health and wellness. Frequent and regular physical exercise boosts the immune system, and helps prevent the “diseases of affluence” such as heart disease, cardiovascular disease, Type 2 diabetes and obesity (3).

Physical exercise includes recreational or leisure-time physical activity, transportation (e.g. walking or cycling), occupational (i.e. work), household chores, play, games, sports or planned exercise, community activities and exercise, in the context of daily life (12). Moderate exercises includes walking briskly, climbing steps, gardening, walking short distances for fetching milk and vegetables, bicycling, yoga and playing with children. Vigorous exercises includes running/jogging (5 miles per hour), bicycling (more than 10 miles per hour), swimming (freestyle laps), aerobics, walking (4½ miles per hour), weight lifting (vigorous effort), competitive sports, and heavy yard work such as digging, cutting wood (10).

The exercise patterns followed by the selected obese subjects were given below in Table IV. Physical activity helps to burn off excess fat. Regular physical activity combined with a healthy diet is the best way of reducing weight. From the selected 1000 subjects 94 subjects i.e. 45 male and 49 female subjects were not doing any exercises. Among the subjects of those who were practicing regular exercises it was observed that, 30.77 per cent and 49.65 per cent of male carried out moderate intensity exercise for less than ½ an hour and more than ½ an hour respectively. In the case of female 32.57 per cent adopted light intensity exercise for less than ½ an hour and 43.08 per cent of subjects were doing moderate intensity exercise for more than ½ an hour. Meagre percent of subjects irrespective of the sexes did heavy or vigorous intensity exercises.

Table 4: Exercise pattern of the subjects

<table>
<thead>
<tr>
<th>Duration (Hrs)</th>
<th>Male (N=429)</th>
<th>Female (N=571)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Moderate</td>
<td>Vigorous</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>&lt; ½</td>
<td>132</td>
<td>30.77</td>
</tr>
<tr>
<td>&gt; ½</td>
<td>213</td>
<td>49.65</td>
</tr>
<tr>
<td>Total</td>
<td>345</td>
<td>80.42</td>
</tr>
</tbody>
</table>

The above results depicts that 50.8 per cent of the selected obese subjects strictly adopted exercise for more than half an hour as they were more health conscious, had an urge to reduce weight and wanted to be free from other complications. But only 39.8 per cent of the selected subjects were following regular exercise for less than half an hour daily, the reasons were lack of time and their inability to adopt heavy physical activities and they were satisfied with light intensity exercise pattern. Strong evidence demonstrates that compared to less active obese subjects individuals who are more active have lower incidence of coronary heart disease, high blood pressure, stroke, Type 2 diabetes, metabolic syndrome, colon and breast cancer and depression. They are likely to have less risk of a hip or vertebral fracture, to exhibit a higher level of cardio-respiratory and muscular fitness and are more likely to achieve weight maintenance to have a healthier body mass and composition (12). Overall, people who do the recommended levels of physical activity can reduce their risk of premature death by 20-30 per cent.

c. Alcohol consumption pattern
The alcohol consumption pattern by the male subjects is given below in Table V. Among the selected obese subjects, male population had the habit of consuming alcoholic drinks, whereas female does not have this habit. Out of 429 male subjects 68.53 per cent have the habit of consuming alcohol, whereas 31.47 per cent do not consume alcohol. The data gathered regarding the frequency and quantity of alcohol consumption revealed that 47.8 per cent, 40.14 per cent and 12.58 per cent of male were respectively consuming 100-150 ml, 150-200 ml and 200-250 ml of alcohol per day.

With regard to the frequency of consumption, 6.8 per cent and 33.33 per cent of male were consuming alcohol daily and twice a week respectively. Around 44 per cent were consuming alcohol once a week and 15.99 per cent were consuming alcohol occasionally. It was happy to note that none of them consume more than 250 ml of alcohol daily.

Table 5: Alcohol consumption pattern of the male subjects

<table>
<thead>
<tr>
<th>S.No</th>
<th>Alcohol Consumption</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Yes</td>
<td>294</td>
<td>68.53</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>135</td>
<td>31.47</td>
</tr>
<tr>
<td>2</td>
<td>Quantity</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>100-150 ml</td>
<td>139</td>
<td>47.28</td>
</tr>
<tr>
<td></td>
<td>150-200 ml</td>
<td>118</td>
<td>40.14</td>
</tr>
<tr>
<td></td>
<td>200-250 ml</td>
<td>37</td>
<td>12.58</td>
</tr>
<tr>
<td>3</td>
<td>Frequency</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Daily</td>
<td>20</td>
<td>6.80</td>
</tr>
<tr>
<td></td>
<td>Twice a week</td>
<td>98</td>
<td>33.33</td>
</tr>
<tr>
<td></td>
<td>Once a week</td>
<td>129</td>
<td>43.88</td>
</tr>
<tr>
<td></td>
<td>Occasionally</td>
<td>47</td>
<td>15.99</td>
</tr>
</tbody>
</table>

Alcoholic beverages such as whisky, brandy, rum, wine and beer contain ethyl alcohol in varying proportions. Alcohol increases blood pressure and heavy drinking weakens the heart muscle. Alcohol consumption has been identified as an important risk factor for illness, disability, and mortality (11).

Alcohol is a source of empty calories (without vitamins, minerals and proteins) and can be turned into fat, adding weight to the body. It increases the level of triglycerides in blood. Though alcohol in small amounts (a glass of beer, 35 ml of whisky and 70 ml of wine) may increase HDL-cholesterol levels in general, it does not increase the


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Caffeine can be considered the mankind’s most popular drug consumed mainly through coffee and tea. The concentration of caffeine depends upon how the beverage is prepared. On an average a cup (150 ml) of percolated coffee has 120 mg of caffeine, a cup of instant coffee 70 mg of caffeine and a cup of tea-50 mg of caffeine. According to a research, 83,269 Japanese people who drank at least one cup of coffee daily had about 20 per cent lower risk of stroke compared to those who rarely drank it. Hence it may be concluded that intake of coffee in the order of one cup daily may be desirable (1).

### 3.4. Association between BMI, type of activity, income level and total cholesterol

Chi square analysis was carried out to find the association between the BMI and other factors and the results obtained are given in Table VIII.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Chi square value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income Vs Total cholesterol</td>
<td>5.55*</td>
</tr>
<tr>
<td>BMI Vs Total cholesterol</td>
<td>83.47**</td>
</tr>
<tr>
<td>Activity Vs Total cholesterol</td>
<td>10.89**</td>
</tr>
<tr>
<td>Income Vs Activity</td>
<td>14.05**</td>
</tr>
<tr>
<td>BMI Vs Activity</td>
<td>9.49**</td>
</tr>
</tbody>
</table>
In a test for association, the null hypothesis states that the two categorical variables are independent, i.e., one variable does not influence the other variables.

From the table it is clear that there is a strong significant association between income and activity (Chi square value-14.05, p=0.005), income and cholesterol (Chi square value - 5.55, p=0.001), BMI and activity pattern (Chi square value - 9.49, p=0.005), BMI and cholesterol level (Chi square value - 83.47, p=0.005) and activity and cholesterol level (Chi square- 10.89, p=0.005). Hence the alternative hypothesis stating the variables are interrelated is accepted.

4. Summary and Conclusion

There is much scope of urbanization and concentration of population in bigger cities. Globalization is also playing an important role for modernization and sedentary life. So in near future obesity would emerge as a challenging problem for India. There exists a considerable gap between the diet and lifestyle pattern in the community. For suitable and convenient weight reduction inclusion high fiber foods in the regular diet with the combination of lifestyle modification such as yoga and exercise therapy records the best result especially in lowering the body weight. Most people who are trying to lose weight focus on one thing: weight loss. However, focusing on dietary and lifestyle changes that will lead to permanent weight loss is much more productive. A better understanding of the aetiological determinants in individual subjects will provide a basis for more rational intervention to prevent this public health problem. Therefore, care should be taken for the future, as prevention is better than cure.

References


Author Profile

Dr.N.Tharani Devi received the MSc and Ph.D in Food Science and Nutrition from Avinashilingam Institute for Home Science and Higher Education for Women University in 2004 and 2015 respectively. During 2004-20013 she was working as Research Assistant in Avinashilingam Institute for Home Science and Higher Education for Women University and later she continued her research in obesity from 2009-2013 analysing the possible treatment for the management of obesity including dietary modification and lifestyle interventions and now working as a Faculty Associate in Amrita Vishwa Vidyapeetham University, Coimbatore since 2013.